



UNIVERSITY OF
LIVERPOOL



Catastrophic costs at the patient level: implications for models

Tom Wingfield

TB-MAC/WHO Annual Meeting
World Bank Offices, Washington DC, USA
Thursday 13th September 2018

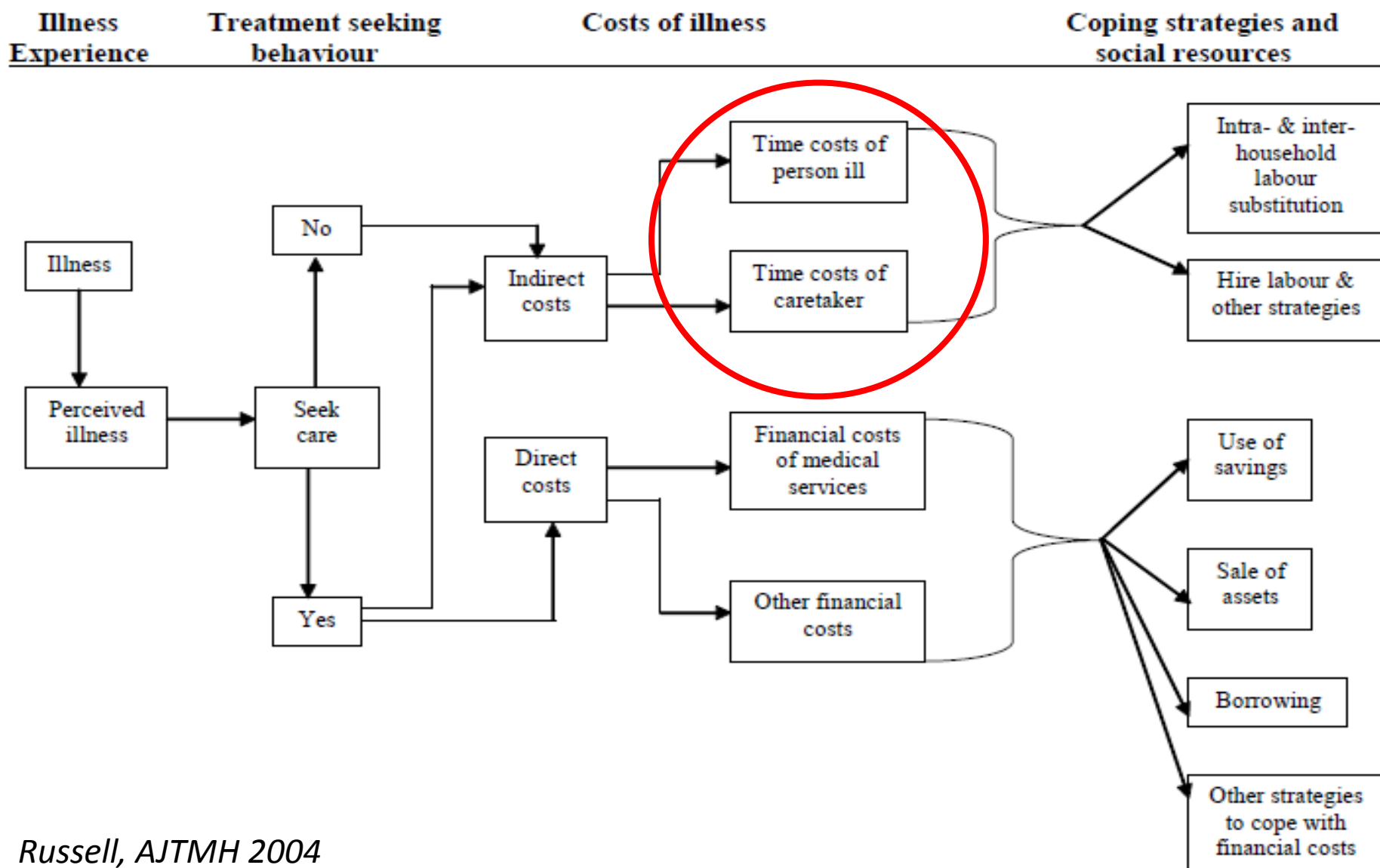
Social determinants

Too Much Dancing Brings T. B.

RECENT scientific investigations have proved that dancing must bear a part of the responsibility for the increase of tuberculosis among young people. Addiction to the terpsichorean diversion usually results in loss of sleep, which cannot be made up adequately on other nights. Insufficient rest and sleep lowers bodily resistance and gives the tuberculosis germs an easy conquest.

(Mechanix, 1932)

TB Costs



TB Costs Measurement

CITIZEN SERVICE DELIVERY CHARTER FOR THIS DISTRICT HOSPITAL
 PREAMBLE
 DISTRICT HOSPITAL AND ITS STAFF IS COMMITTED TO PROVIDE HIGH QUALITY HEALTH CARE SERVICES TO OUR CLIENTS WITH DIGNITY, PROFESSIONALISM AND WITHIN THE SHORTEST TIME POSSIBLE.

SERVICES RENDERED	USER CHARGES	WAITING TIME	SERVICES RENDERED	USER CHARGES	WAITING TIME
ATTENDANCE AND CUSTOMER CARE DESK/ ENQUIRIES	FREE	5 MINUTES	8. EMERGENCY ADMISSION	PRIVILEGE AFTER TREATMENT	15 MINUTES
PAYMENTS FOR HOSPITAL CHARGES	FREE	30 MINUTES	10. EMERGENCY SERVICES	PRIVILEGE AFTER TREATMENT	15 MINUTES
3. REGISTRATION CARD	200/- - 100/-	30 MINUTES	11. EMERGENCY OPERATION	PRIVILEGE AFTER TREATMENT	15 MINUTES
4. CONSULTATION:- * ADULT & CHILDREN ABOVE 5 YEARS (HOSPITAL/SPECIALISTS)	50/-	20 MINUTES	12. NON-EMERGENCY ADMISSION	PRIVILEGE AFTER TREATMENT	20 MINUTES
* CHILDREN BELOW 5 YEARS (CLINIC)	FREE	20 MINUTES	13. NON-EMERGENCY OPERATION	PRIVILEGE AFTER TREATMENT	20 MINUTES
5. DISPENSING MEDICINE	20/- - 1000/-	20 MINUTES	14. COLLECTING BODY FROM MORTUARY	FREE	1 HOUR
6. VACCINATIONS	FREE	20 MINUTES	* MORTUARY CHARGES	200/- PER DAY	1 HOUR
7. LABORATORY SERVICES	30/- - 400/-	30 MINUTES	* TRANSFER FROM WARD TO MORTUARY	FREE	1 HOUR
8. X-RAY SERVICES	100/- - 800/-	30 MINUTES	* TREATMENT	1000/- - 2000/-	1 HOUR
			15. PRIVATE WARD	1000/- - 1200/-	15 MINUTES
			16. MEDICAL EXAMINATION/OPD	100/-	15 MINUTES
			17. MEDICAL BOARD	1000/- - 1500/-	15 MINUTES

ANY SERVICE THAT DOES NOT CONFORM TO THE ABOVE CHARTER SHALL BE SUBJECT TO BE SUED FOR DAMAGES IN COURT.
 MEDICAL SUPERINTENDENT TO EXERCISE FULL ACCOUNTABILITY FOR ALL SERVICES RENDERED AND NOTIFICATION
 TREATMENT FOR MALARIA, TB, HIV/AIDS AND EPIDEMIC IS FREE
 MEDICAL SUPERINTENDENT TO EXERCISE FULL ACCOUNTABILITY FOR ALL SERVICES RENDERED AND NOTIFICATION

The Tool to Estimate Patients' Costs

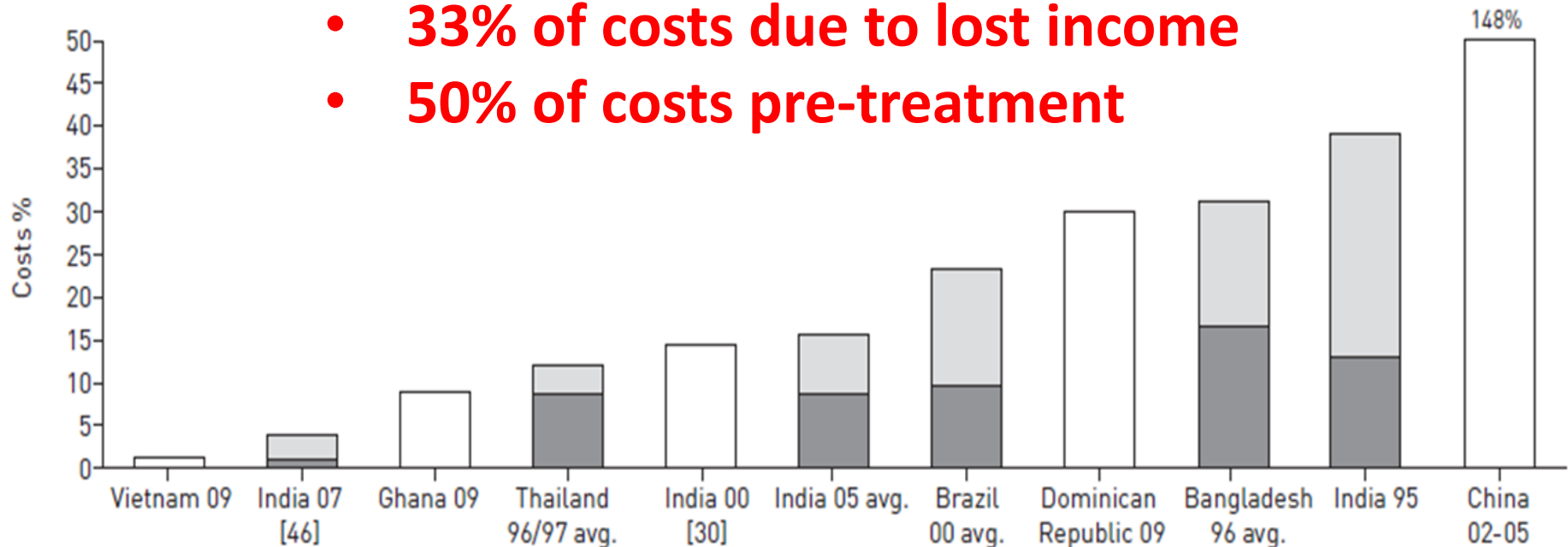
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Financial burden for tuberculosis patients in low- and middle-income countries: a systematic review

Tadayuki Tanimura, Ernesto Jaramillo, Diana Weil, Mario Raviglion and Knut Lönnroth

- 33% of costs due to lost income
- 50% of costs pre-treatment



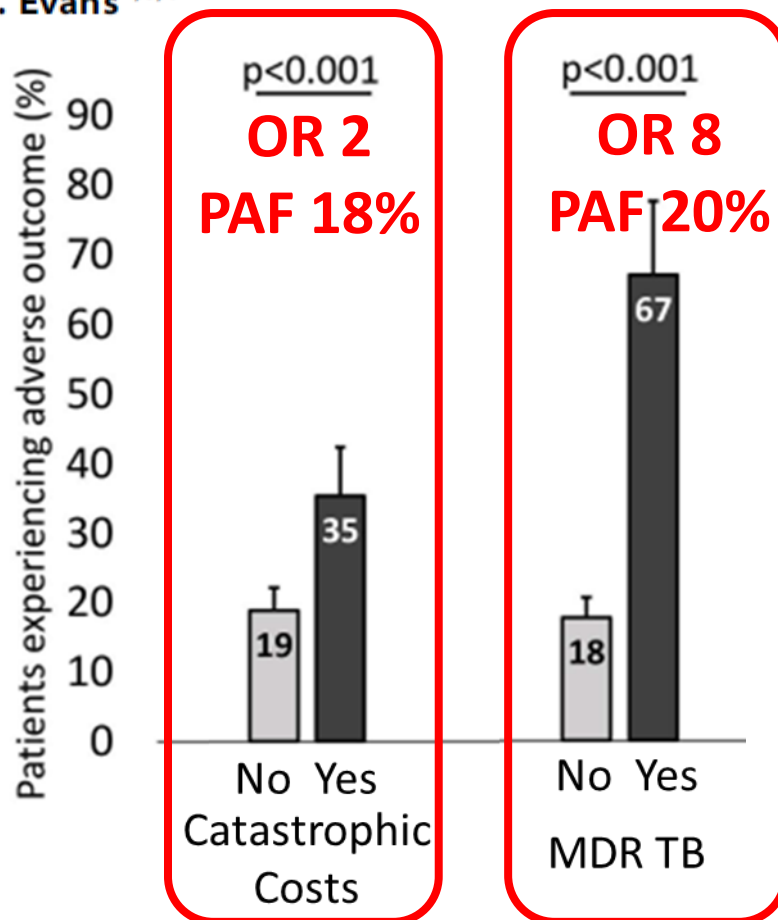
Defining catastrophic costs in Peru

Defining Catastrophic Costs and Comparing Their Importance for Adverse Tuberculosis Outcome with Multi-Drug Resistance: A Prospective Cohort Study, Peru

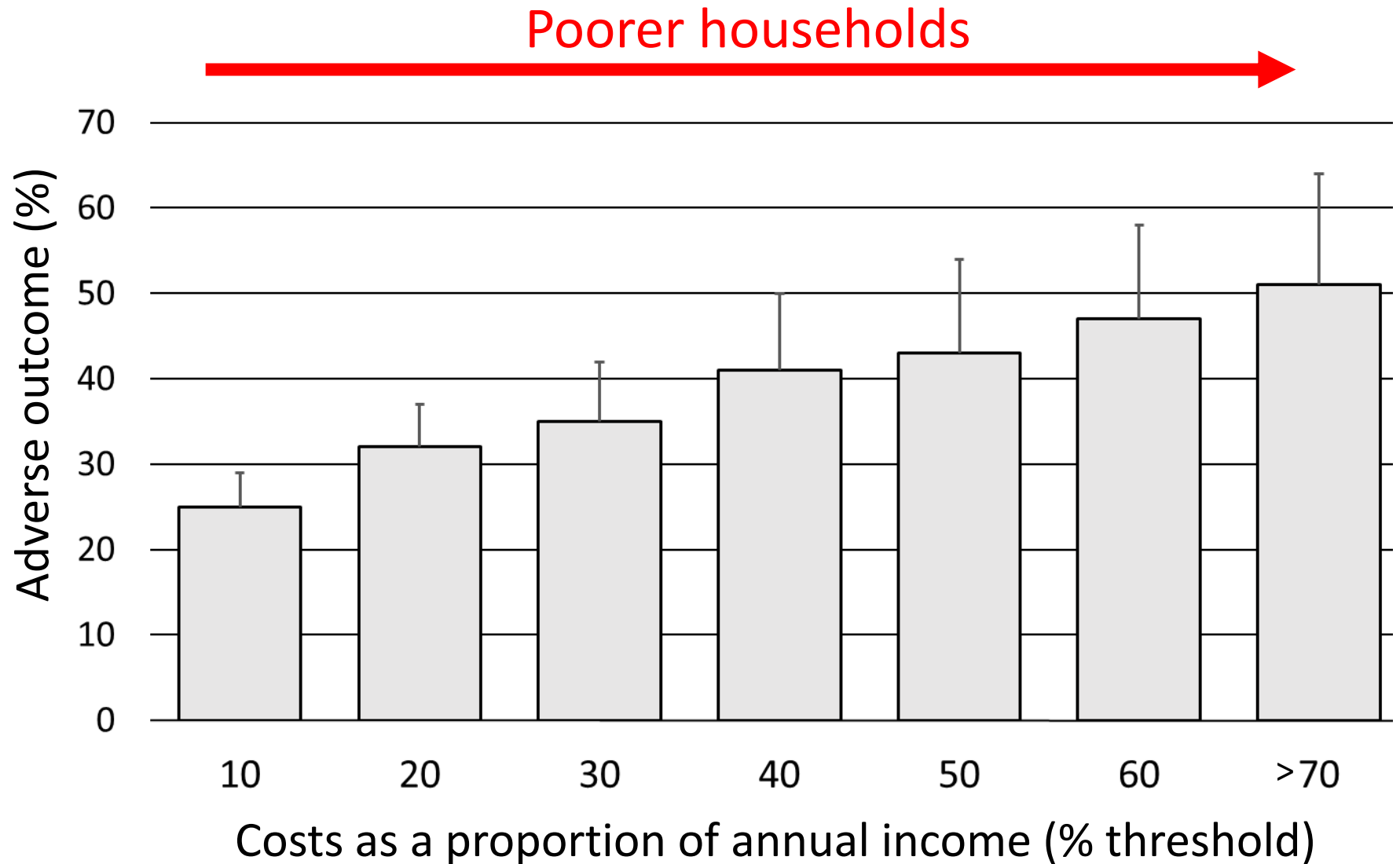
Tom Wingfield^{1,2,3,4*}, Delia Boccia^{2,5}, Marco Tovar^{1,2}, Arquímedes Gavino², Karine Zevallos^{1,2,6}, Rosario Montoya^{1,2}, Knut Lönnroth⁷, Carlton A. Evans^{2,3,6}



**Total costs of >20% of
TB-affected household's
annual income
=
Catastrophic costs**



Differential costs and impact



THE

END TB

STRATEGY

Eliminate catastrophic costs
Provide socioeconomic support

TUBERCULOSIS PATIENT COST SURVEYS: A HANDBOOK

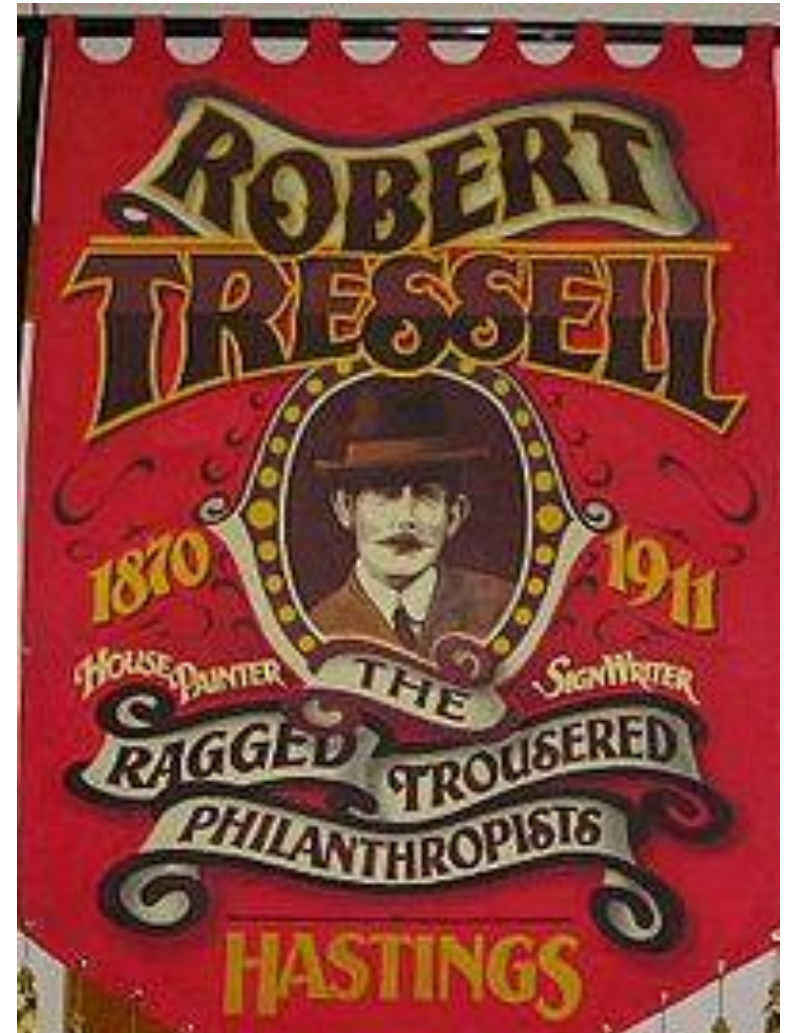


World Health
Organization

Addressing social determinants of TB

Addressing social determinants

“Those who profess to be desirous of preventing and curing consumption must be either hypocrites or fools, for they **ridicule the suggestion that it is necessary first to cure and prevent the poverty** that compels badly clothed and half-starved human beings to sleep in such dens as this.” (1912)



Household randomized
evaluation of a socioeconomic
intervention to prevent TB

(The “HRESIPT” Trial in Peru)

HRESIPT

Household RCT of socioeconomic support

Goals

Find TB

Prevent TB

Cure TB

Control TB

Outputs



Social support:

household visits and community meetings



Contacts screened for TB infection and TB disease

Contacts with TB infection start preventive therapy

Patients with TB adhere to and complete TB treatment

Educate, inform, and reduce stigma for TB-affected households

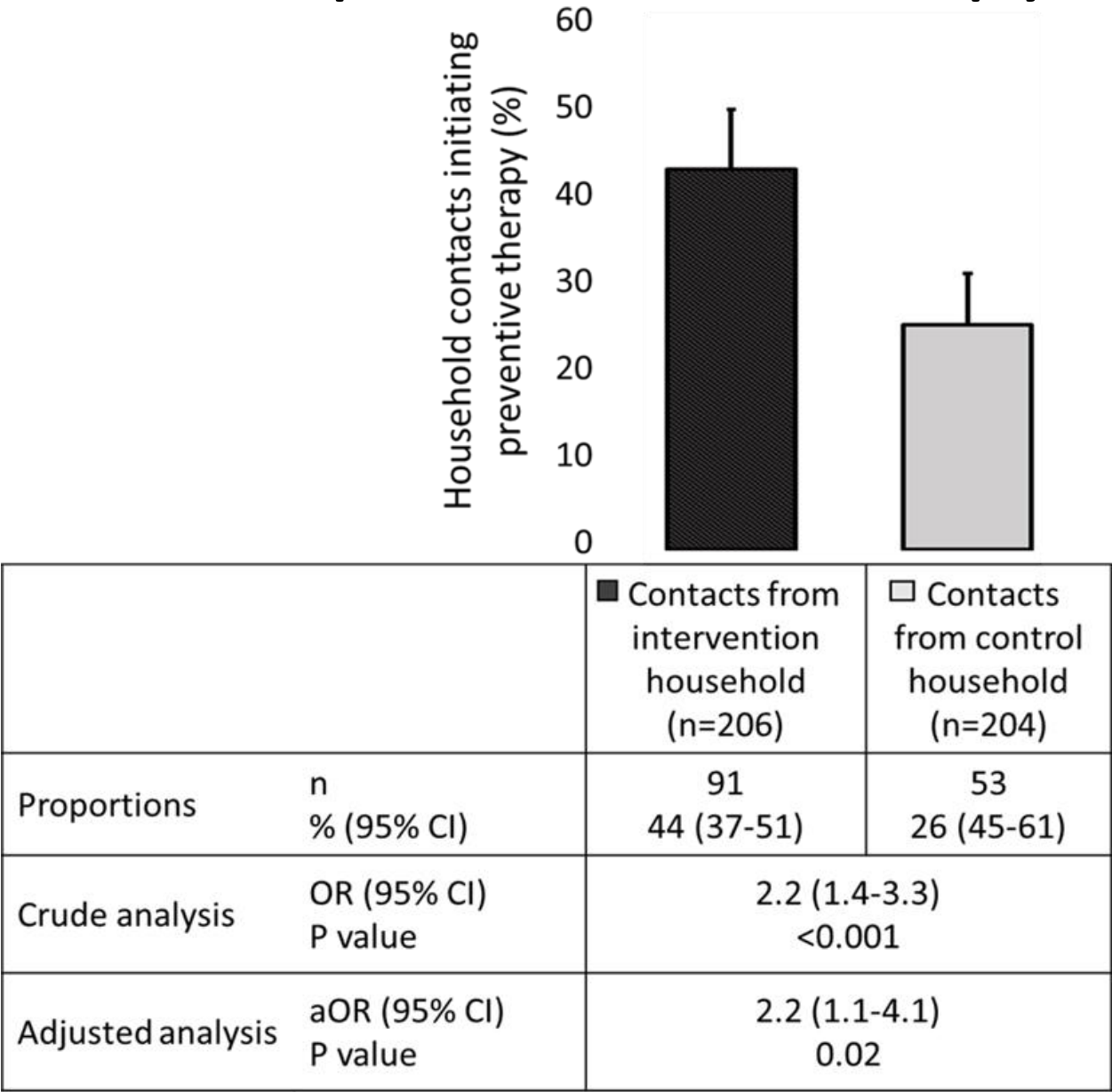


Economic support:

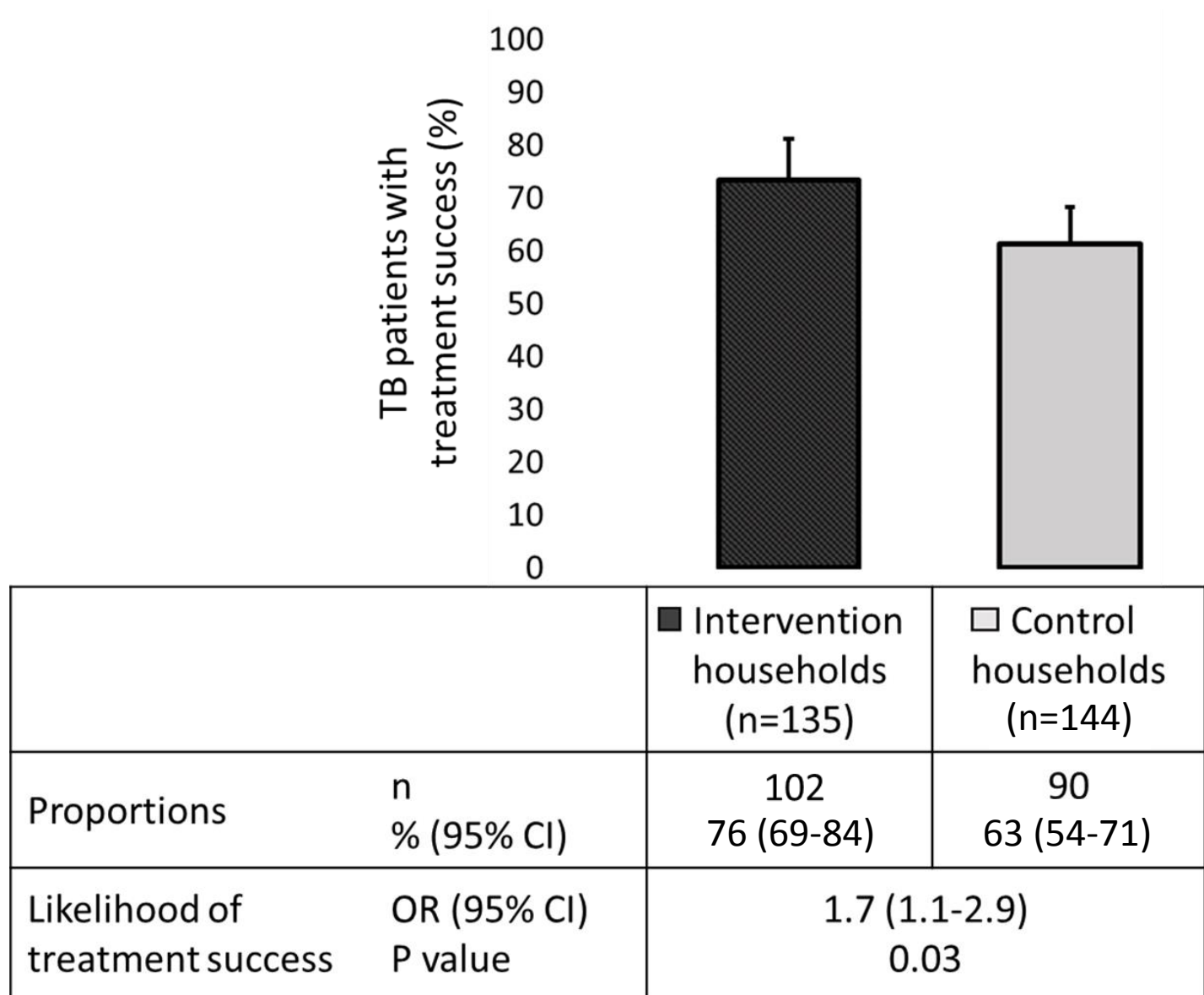
conditional cash transfers (<\$230)



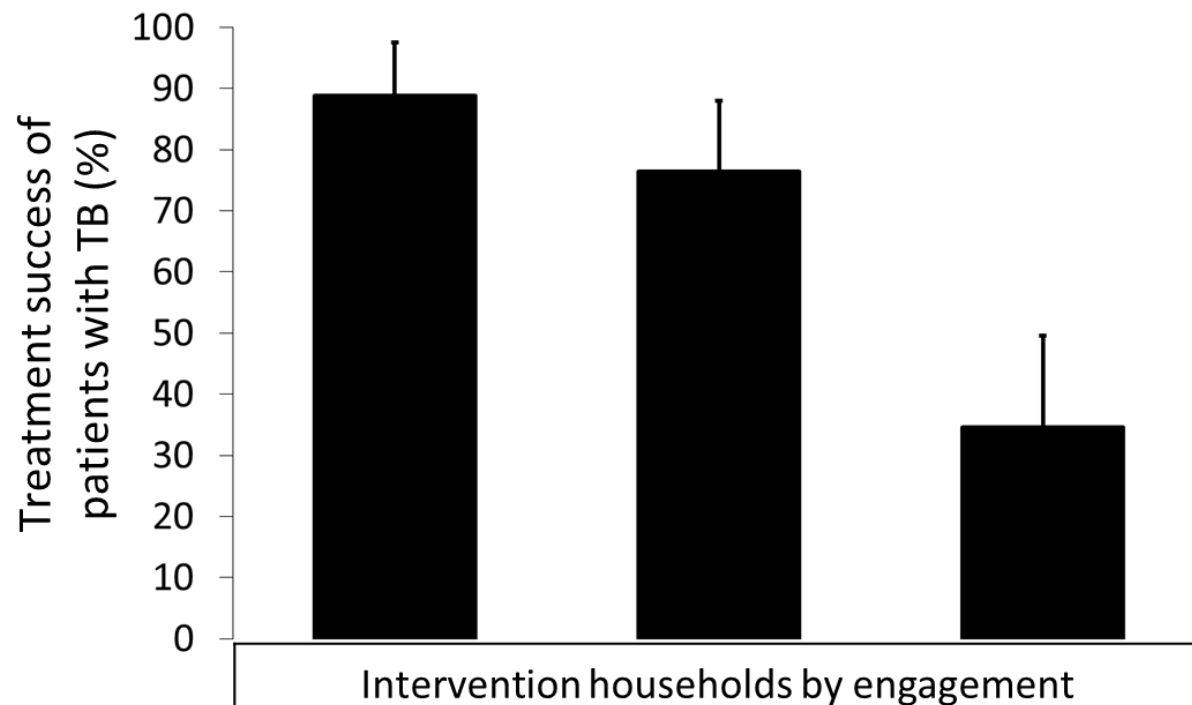
Initiation of TB preventive therapy



TB treatment success

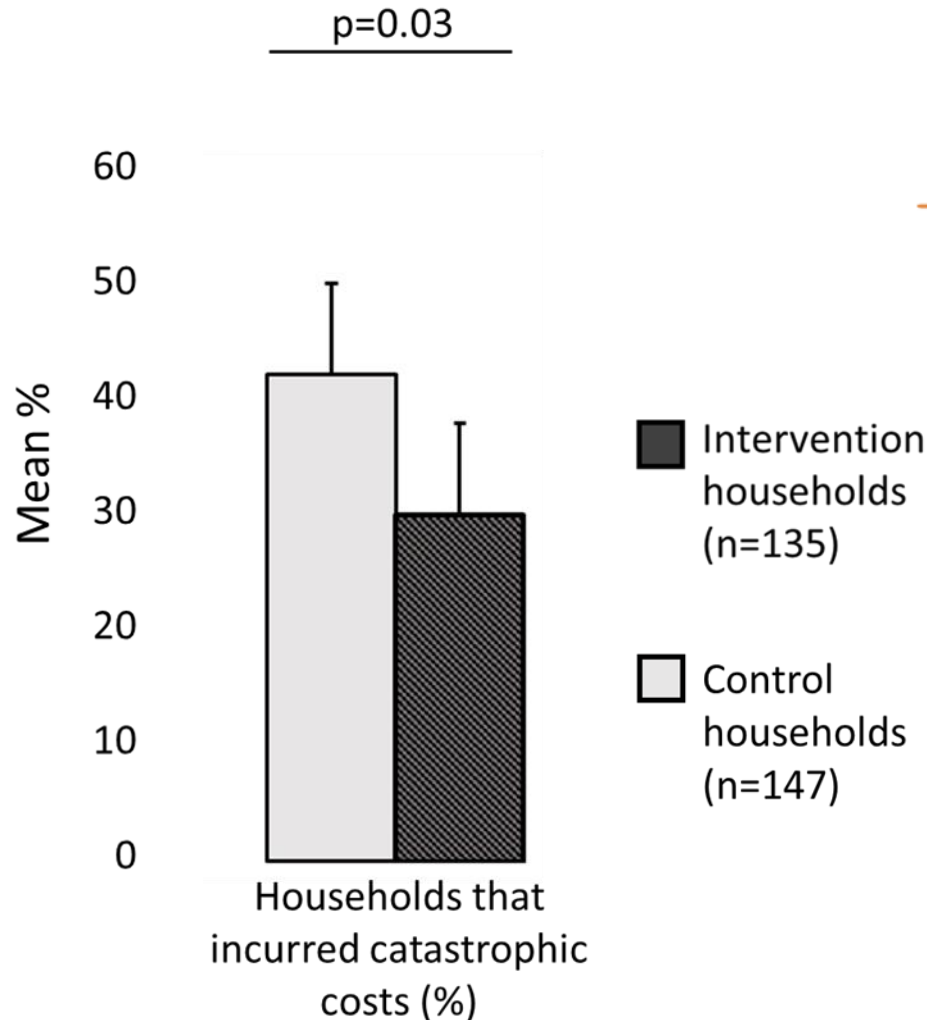


TB treatment success (heterogeneity)



		Intervention households by engagement		
		Engaged with all activities (n=54)	Engaged with some activities (n=55)	Engaged with no activities (n=26)
Proportions	n % (95% CI)	48 89 (80-98)	42 76 (65-88)	9 35 (15-54)
Likelihood of treatment success	OR (95% CI) P value	5.1 (2.0-13) <0.001	2.0 (1.0-4.1) 0.047	0.34 (0.14-0.8) 0.01

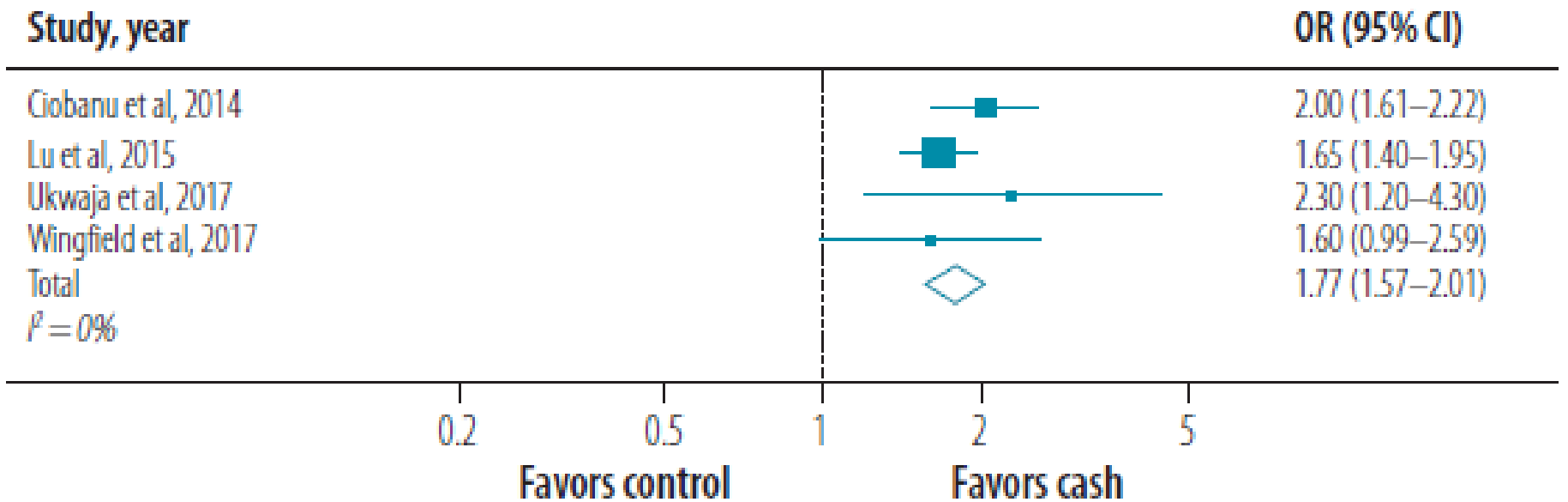
Combating catastrophic costs



....adapting
socioeconomic
intervention for
multi-country
“Beyond TB” trial

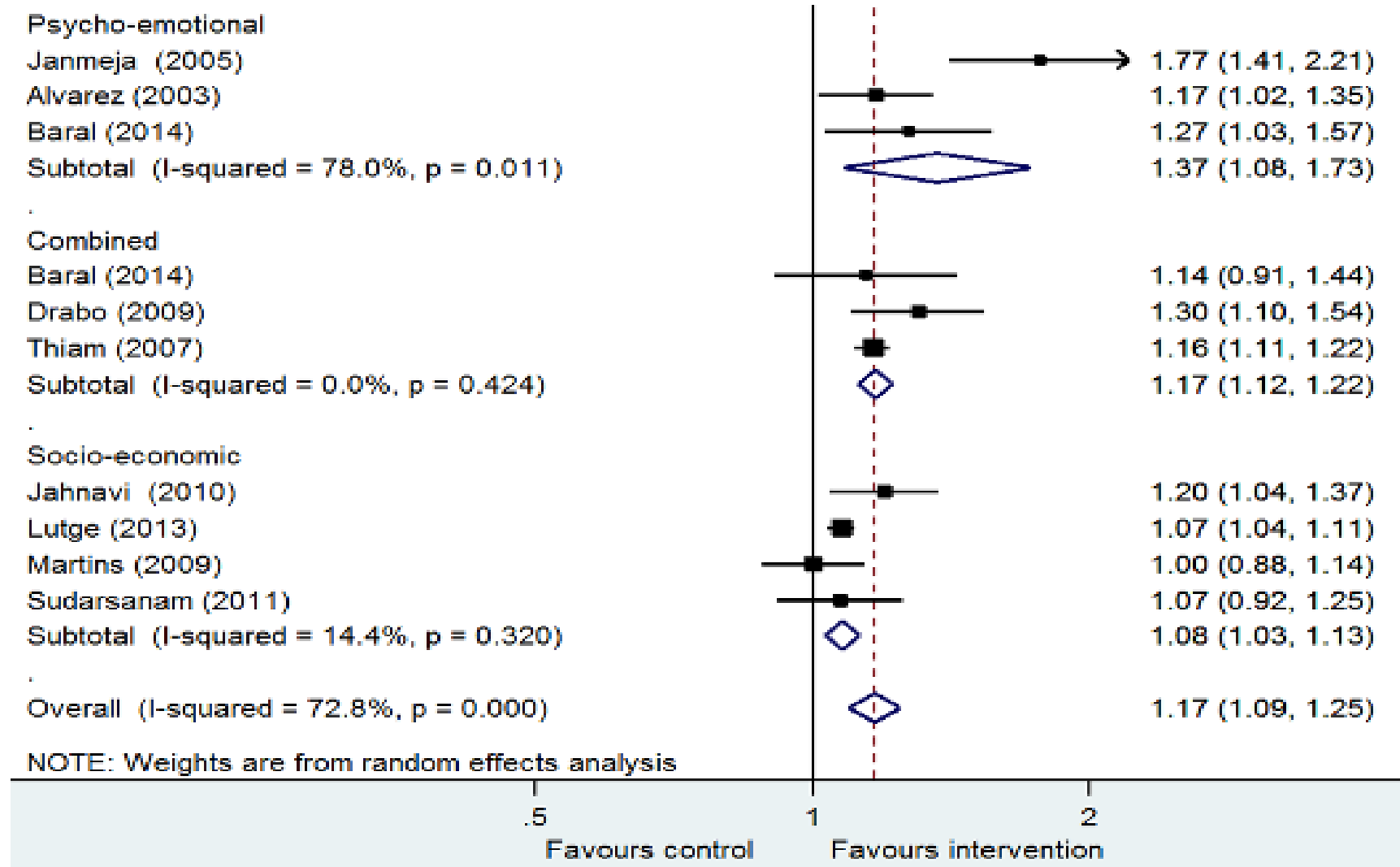
Wider evidence for TB-specific socioeconomic interventions

Cash transfers in LMICs



Richterman, Bull WHO, 2018

Psycho-emotional and socioeconomic interventions

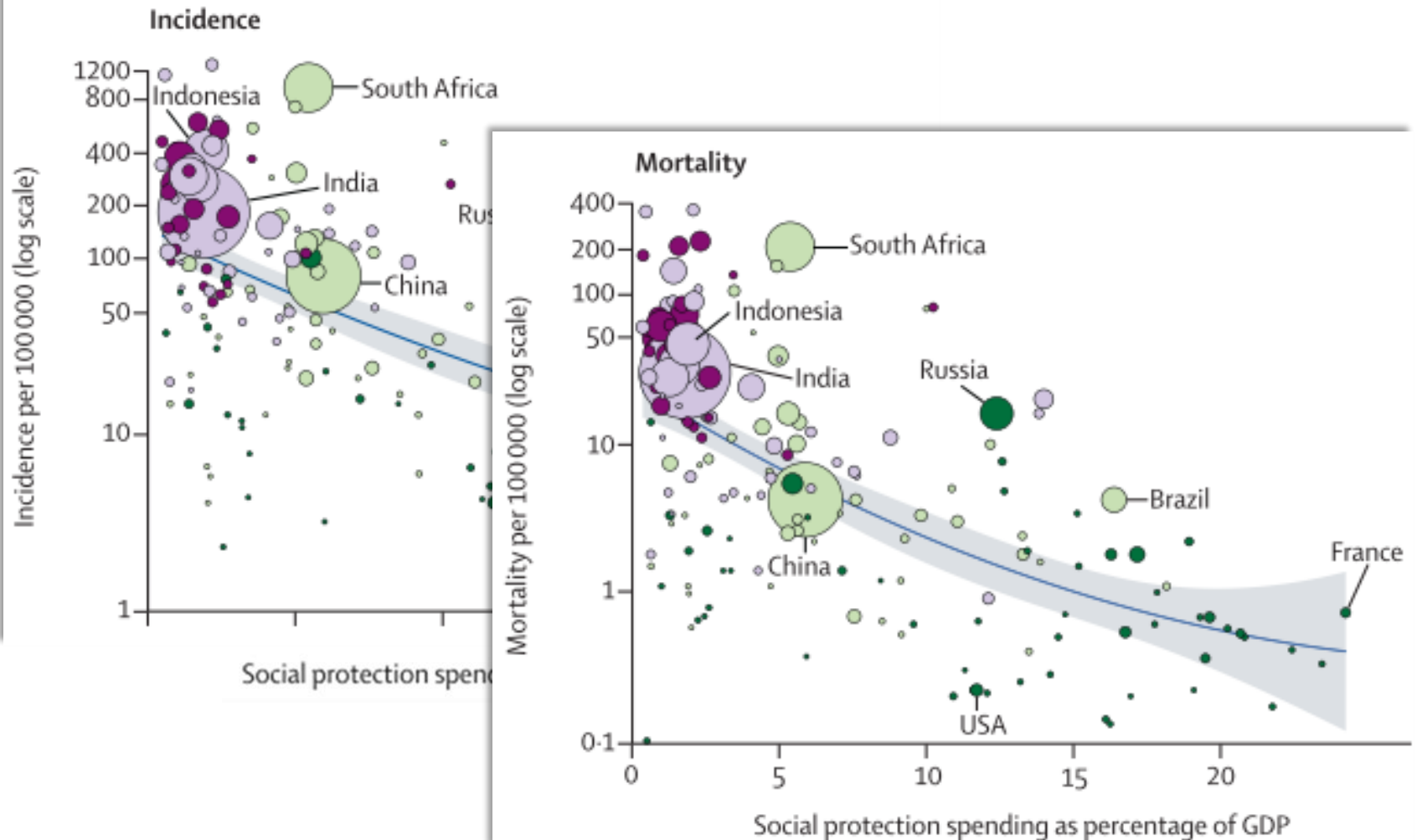


Wider evidence for
TB-sensitive interventions
(social protection)

Association between spending on social protection and tuberculosis burden: a global analysis

Lancet Infect Dis 2016;
16: 473-79

Andrew Siroka, Ninez A Ponce, Knut Lönnroth



Case Study: Brasil's Bolsa Familia

Trans R Soc Trop Med Hyg. 2016 March ; 110(3): 199–206. doi:10.1093/trstmh/trw011.

Effectiveness of a conditional cash transfer programme on TB cure rate: a retrospective cohort study in Brazil

Ana W. Torrens^{a,*}, Davide Rasella^b, Delia Boccia^c, Ethel L. N. Maciel^d, Joilda S. Nery^e, Zachary D. Olson^f, Draurio C. N. Barreira^g, and Mauro N. Sanchez^h

Treatment success OR 1.07 (95%CI=1.04-1.11)

Int J Tuberc Lung Dis. 2017 July 01; 21(7): 790–796. doi:10.5588/ijtld.16.0599.

Effect of Brazil's conditional cash transfer programme on tuberculosis incidence

J. S. Nery^{*}, L. C. Rodrigues[†], D. Rasella^{*}, R. Aquino^{*}, D. Barreira[‡], A. W. Torrens[‡], D. Boccia[†], G. O. Penna[§], M. L. F. Penna[¶], M. L. Barreto^{*}, and S. M. Pereira^{*}

TB incidence in regions with high social protection coverage OR 0.96 (95%CI=0.93-0.99)

Costs considerations for modellers

- Cost Survey methodological issues
 - Catastrophic costs definitions
 - 5/10/20% of annual income^{1,2,3} & 40% “capacity to pay”⁴
 - Lost income estimations
 - Output vs Human Capital Approach
 - Extrapolation of costs
 - Longitudinal versus cross-sectional approach
- Subgroups / heterogeneity
 - Comorbidities, MDR, age, gender, public/private mix, poverty
- Health system and social care/protection coverage
- Impact of costs on TB transmission largely unknown
- Causal pathways unclear

1. Berki, *Health Aff*, 1986

2. Laokri, *Bull WHO* 2012

3. Ukwaja, *Inf Dis Pov*, 2013

4. Wingfield, *PLOS Med* 2014

5. Leive, *Bull WHO*, 2008

INT J TUBERC LUNG DIS 17(7):866–877

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<http://dx.doi.org/10.5588/ijtld.12.0573>

Data needs for evidence-based decisions: a tuberculosis **trialist's** 'wish list'

D. W. Dowdy,^{*,†} C. Dye,[‡] T. Cohen^{§¶}

a tuberculosis **trialist's** 'wish list'

- Clarity/transparency of model methods for uninitiated
- Early and sustained collaboration
 - Design (trials / implementation research / NTP)
 - Funding applications
 - Interim analysis (especially multi-arm multi-stage studies)
 - Translation to policy
- Data requirements for models
 - Ideal vs feasible
 - Prioritisation of variables/data
 - Global vs country vs regional level
- Model outputs accounting for subgroups/heterogeneity to support targeting of interventions
- Linkage with extended cost-effectiveness analysis for broadest impact
- Consideration of wider implications on health/wellbeing

Thank you!

- Knut Lonnroth
- Carlton Evans
- Maxine Caws
- Bertie Squire
- Peter MacPherson
- Delia Boccia
- Celso Khosa
- Innovation For Health And Development
- Birat Nepal Medical Trust



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